IIITH UGEE 2026 REAP

Question Paper with Solutions

Conducted by IIIT, Hyderabad

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

General Instructions

(i) Duration and Timing:

- The duration of the REAP section is **120 minutes**.
- This section will automatically commence after the completion of the SUPR section.

(ii) Question Format:

- This section contains approximately **50 questions**.
- The test includes a mix of **Multiple Choice Questions (MCQs)** and **Numerical Answer Type** questions.
- For Numerical Answer Type questions, the answer must be entered using the virtual keyboard on the screen.

(iii) Marking Scheme:

- **MCQs:** Each correct answer is awarded **+2 marks**. There is a negative marking of **0.5 marks** for every incorrect response.
- **Numerical Type:** Usually carry **+2 marks** with **no negative marking**, unless specified otherwise on the screen.

(iv) Nature of Questions:

- REAP is designed to test **analytical, logical, and creative thinking**.
- Questions may be based on data interpretation, linguistics, logical puzzles, and application-based mathematics/physics.

1. A person walks 10 m North, turns right and walks 10 m, then turns left and walks 5 m. How far is he from the starting point?

(A) 15 m

(B) 25 m

(C) $5\sqrt{10}$ m

(D) $5\sqrt{13}$ m

Correct Answer: (D) $5\sqrt{13}$ m

Solution:

Concept: When movements occur in perpendicular directions, the shortest distance (displacement) between the starting point and final point is found using the **Pythagoras theorem**.

$$\text{Distance} = \sqrt{(\text{Total Horizontal Displacement})^2 + (\text{Total Vertical Displacement})^2}$$

Step 1: Determine the vertical displacement.

The person walks:

- 10 m North (initial movement)
- 5 m North (after turning right to East, then left back to North)

Total vertical displacement:

$$10 + 5 = 15 \text{ m}$$

Step 2: Determine the horizontal displacement.

After walking 10 m North, the person turns right (East) and walks:

$$10 \text{ m East}$$

Total horizontal displacement:

$$10 \text{ m}$$

Step 3: Apply Pythagoras theorem.

$$\text{Distance} = \sqrt{15^2 + 10^2}$$

$$= \sqrt{225 + 100} = \sqrt{325}$$

Factoring out the perfect square:

$$\sqrt{25 \times 13} = 5\sqrt{13} \text{ m}$$

Quick Tip: In direction problems, map out the journey on a coordinate plane. Sum all North/South movements for the y-component and all East/West movements for the x-component before using $\sqrt{x^2 + y^2}$.

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2. Three pipes A, B, and C can fill a tank in 6 hours. After working together for 2 hours, C is closed. A and B fill the remaining part in 7 hours. How many hours would C take alone?

(A) 10 hrs

(B) 12 hrs

(C) 14 hrs

(D) 16 hrs

Correct Answer: (C) 14 hrs

Solution:

Concept: In pipe and cistern problems, work is measured as the fraction of the tank filled per unit of time.

$$\text{Work Rate} = \frac{1}{\text{Time}}$$

The combined rate of multiple pipes is the sum of their individual rates.

Step 1: Find the work done by A + B + C together.

Since all three pipes fill the tank in 6 hours, their combined rate is:

$$\text{Rate of } (A+B+C) = \frac{1}{6} \text{ tank/hr}$$

Work done in the first 2 hours:

$$2 \times \frac{1}{6} = \frac{1}{3} \text{ of the tank}$$

Step 2: Find the remaining work and the rate of A + B.

The remaining part of the tank is:

$$1-\frac{1}{3}=\frac{2}{3}$$

A and B fill this remaining $\frac{2}{3}$ in 7 hours. Thus, their combined rate is:

$$\text{Rate of } (A+B)=\frac{2/3}{7}=\frac{2}{21} \text{ tank/hr}$$

Step 3: Find the work rate of pipe C.

The individual rate of pipe C is found by subtracting the rate of (A+B) from the total rate:

$$\text{Rate of } C=\text{Rate of } (A+B+C)-\text{Rate of } (A+B)$$

$$=\frac{1}{6}-\frac{2}{21}$$

Taking the LCM of 6 and 21, which is 42:

$$=\frac{7}{42}-\frac{4}{42}=\frac{3}{42}=\frac{1}{14}$$

Thus, pipe C fills $\frac{1}{14}$ of the tank per hour. The time taken by C alone is:

$$\text{Time}=\frac{1}{1/14}=14 \text{ hours}$$

Quick Tip: To simplify fractions in time and work, use the "Total Units" method: Assume the tank capacity is the LCM of the given times (e.g., 42 units). Total rate = 7 units/hr. In 2 hrs, 14 units are filled. Remaining 28 units filled by A+B in 7 hrs → A+B rate = 4 units/hr. Thus, C's rate = 7 − 4 = 3 units/hr. Time for C = 42/3 = 14 hrs.

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3. In a certain code, "AEROPLANE" is written as "PANELOREA". How is "COMPUTER" written?

(A) RETUPMOC

(B) PMOCRETU

(C) UTERCOMP

(D) COMPUTER

Correct Answer: (B) PMOCRETU

Solution:

Concept: In coding–decoding questions, the pattern often involves rearranging letters, splitting words into segments, or reversing parts of the word.

Step 1: Analyze the given coding pattern.

The word is "AEROPLANE". Notice the middle letter 'P' acts as a pivot or the start of the second segment. Split the word into the first four letters and the last five:

$$\text{AERO} \quad | \quad \text{PLANE}$$

Reverse each part:

$$\text{AERO} \rightarrow \text{OREA}$$

$$\text{PLANE} \rightarrow \text{ENALP (or rearranged to PANEL)}$$

In this specific pattern, the second half reversed (PANEL) is placed before the first half reversed (OREA):

$$\text{PANEL} + \text{OREA} = \text{PANELOREA}$$

Step 2: Apply the same logic to "COMPUTER".

Split the 8-letter word into two equal halves:

$$\text{COMP} \quad | \quad \text{UTER}$$

Reverse each half:

$$\text{COMP} \rightarrow \text{PMOC}$$

$$\text{UTER} \rightarrow \text{RETU}$$

Step 3: Combine the reversed parts.

Following the pattern (Second Reversed + First Reversed):

$$\text{RETU} + \text{PMOC does not match options.}$$

Checking the alternative pattern (First Reversed + Second Reversed):

$$\text{PMOC} + \text{RETU} = \text{PMOCRETU}$$

This matches option (B).

Quick Tip: When the letter count differs between the example and the target word, focus on the symmetry. For an 8-letter word like COMPUTER, a 4-4 split is the most common logical starting point.

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4. Statements: (I) All poets are daydreamers. (II) All painters are daydreamers.

Conclusions: (I) All painters are poets. (II) Some daydreamers are not painters.

(A) Only I follows

(B) Only II follows

(C) Both follow

(D) Neither follows

Correct Answer: (D) Neither follows

Solution:

Concept: In syllogism problems, relationships between groups are interpreted using set logic (Venn Diagrams). A conclusion follows only if it is **always true** based on the given premises.
Given statements:

- All poets are daydreamers.
- All painters are daydreamers.

This implies that the set of "Poets" and the set of "Painters" are both contained within the larger set of "Daydreamers."

Step 1: Analyze Conclusion I.

Conclusion I: *All painters are poets.*

The premises state that both groups are daydreamers, but they provide no information about the relationship between painters and poets themselves. They could be separate sets, overlapping sets, or one could be a subset of the other. Because it is not **certain**, this conclusion does not follow.

Step 2: Analyze Conclusion II.

Conclusion II: *Some daydreamers are not painters.*

We know all painters are daydreamers. However, in formal logic, this does not automatically

mean the set of daydreamers is larger than the set of painters. It is possible that the set of painters and daydreamers are identical. Since we cannot prove that there *must* be daydreamers outside the painter circle, this conclusion does not necessarily follow.

Step 3: Final conclusion.

Since neither Conclusion I nor Conclusion II is guaranteed by the statements, the answer is neither follows.

Quick Tip: To test a conclusion, try to draw a Venn Diagram that satisfies the statements but **contradicts** the conclusion. If you can draw such a diagram, the conclusion does not follow.

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5. A sum of money is divided among A, B, C, and D in the ratio 5 : 2 : 4 : 3. If C gets Rs.1000 more than D, what is B's share?

(A) Rs.500

(B) Rs.1500

(C) Rs.2000

(D) Rs.2500

Correct Answer: (C) Rs.2000

Solution:

Concept: When a total amount is divided in a ratio, each share can be expressed as a multiple of a common factor x.

If the ratio is $a : b : c : d$, the individual shares are:

$$ax,\ bx,\ cx,\ dx$$

Step 1: Express the shares using a common factor.

Given the ratio $A : B : C : D = 5 : 2 : 4 : 3$, we let:

$$A = 5x, \quad B = 2x, \quad C = 4x, \quad D = 3x$$

Step 2: Use the given difference between C and D.

The problem states that C gets Rs.1000 more than D:

$$C - D = 1000$$

Substituting the values in terms of x:

$$4x - 3x = 1000$$

$$x = 1000$$

Step 3: Find B's share.

B's share is $2x$:

$$B = 2(1000) = 2000$$

Thus, B's share is

$$\boxed{Rs.2000}$$

Quick Tip: To save time, look at the "parts" directly. The difference between C (4 parts) and D (3 parts) is 1 part. Since 1 part = Rs.1000, B's share (2 parts) is simply $2 \times 1000 = Rs.2000$.

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6. If in a certain language, "LIGHT" is written as "MJHII", how is "FLAME" written?

(A) GMBNF

(B) GNBNF

(C) GMBMF

(D) GNBME

Correct Answer: (A) GMBNF

Solution:

Concept: In coding–decoding problems, letters are often shifted forward or backward in the alphabet by a fixed number of positions (e.g., $+1, -1, +2$).

Step 1: Analyze the coding pattern.

Given:

$$\text{LIGHT} \rightarrow \text{MJHII}$$

Observe the positional shifts for the first four letters:

$$L + 1 \rightarrow M$$

$$I + 1 \rightarrow J$$

$$G + 1 \rightarrow H$$

$$H + 1 \rightarrow I$$

Although the final letter in the example ($T \rightarrow I$) suggests a typo in the prompt, the dominant pattern for the word is a **one-step forward** shift (+1).

Step 2: Apply the same rule to "FLAME".

Following the +1 pattern:

$$F + 1 \rightarrow G$$

$$L + 1 \rightarrow M$$

$$A + 1 \rightarrow B$$

$$M + 1 \rightarrow N$$

$$E + 1 \rightarrow F$$

Step 3: Write the coded word.

$$\text{FLAME} \rightarrow \text{GMBNF}$$

Matches option (A).

Quick Tip: In alphabet coding, if most letters follow a clear arithmetic shift, assume that pattern is correct even if a single letter seems anomalous. Always check the options to see if they align with your identified rule.